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AUTHOR Chapman, Ann D.
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Using Interactive Video to Teach Learning Theory to Undergraduates: Problems And Benefits

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Presented by

Ann D. Chapman, Ph.D.
Associate Professor
Educational Psychology and Counseling
Eastern Kentucky University

406 Combs Classroom Building
Richmond, KY 40475-3111
PHONE: 606-622-1131
EMAIL: EADCHAPM@ACS.EKU.EDU

TM026369

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Abstract

Recent advances in technology enable universities to radically expand traditional definitions of both 'the classroom' and 'distance learning'. In this paper one professor's initial experience using interactive video to teach learning theories to 29 undergraduate education students in 4 locations is analyzed. Class sizes at the individual sites ranged from 1 to 14. Data included the instructor's formal and informal notes, students' mid-term and final class evaluations, students' test grades, and students' work which assessed their ability to recognize the learning theory underlying actual practices in live classrooms. Comparisons are made with the work of previous students in the instructor's traditional-classroom learning theory courses. Benefits and problems for both instructors and students are discussed and methods for overcoming problems are suggested.

In the Commonwealth of Kentucky, and throughout this country, recent advances in technology are enabling universities to use innovative combinations of audio, video, and computers to radically expand traditional definitions of both 'the classroom' and 'distance learning'. In the past 'degrees by mail' were often considered to be of questionable validity. Today, new technologies and approaches have brought distance education into the mainstream of higher education. Respected, fully accredited universities are offering courses, degrees and post-degree continuing education programs in many locations including off-campus centers, elementary, middle and secondary schools, factories, and learners' homes.

One of the newest forms of distance education technology is interactive video which offers almost immediate two-way audio and video. Interactive video appears to make it possible to duplicate the interpersonal interaction occurring in a traditional classroom situation. Some states, for example North Dakota, offer full degree programs over interactive video (Watkins, 1994); others, like Iowa, are experimenting with the use of interactive television in a special academic area such as preservice teacher education (Herring, 1993). Vermont is an example of states who use interactive video to offer training to meet the special needs of employed individuals such as teachers (Podhajski, 1995).

The increase in the use of technology for higher education distance learning results from a combination of student needs, faculty interest, political support and pressure and financial reality. For students, distance learning technology enables those in remote areas and work schedules that do not match with class times to receive courses and needed information. For faculty, an interest in technology can be combined with their interest in their academic field. Many politicians see the new distance learning technologies as essential to higher education meeting the needs of their area. Some university administrators believe that in order to retain the number of students needed to make a university viable, distance courses must be offered via technology. With this broad base of support, it is clear that some form of the marriage of

technology and distance learning is here to stay.

As higher education embraces and implements new distance learning technology, if the methodology is to be as effective as it can be, some questions about the educational impact of the various technological approaches need to be answered. When is an approach most effective? How can an approach be more effective? What content can be effectively learned through distance learning? Is there content which cannot be effectively learned at a distance? What is gained and what is lost when a course is offered through distance learning: and, is there at least a balance between the gains and the losses? To insure the most effective implementation of new distance learning technologies these questions must be answered as early as possible in the delivery of distance learning courses.

This paper presents the results of a case study of one instructor's initial experience teaching an undergraduate educational psychology course in learning theories via interactive video. The instructor had taught the course for six years in a traditional classroom. The study was undertaken to determine possible benefits, to examine and suggest possible ways to ameliorate problems, and to propose areas for further research related to using interactive video to teach a specific course. This type of information is essential if the questions in the above paragraph are to be answered. It will also be helpful in determining the amount of faculty and student change that will be necessary and the types of training that will be most beneficial to the effective use of interactive video in a specific area.

Previous Research

A review of the literature on distance learning revealed that most articles in this area simply describe new technologies (Russell, 1993; Sagan, 1995) and programs or courses being taught (Podhajski, 1995). A few articles have discussed the use of interactive video in specific teaching areas. Gamble (1995) described the use of interactive video to deliver special education courses. The project involved extensive course redesign and a strong emphasis on

teacher/mentor relationships and advising.

Some recent articles focus on effective general teaching methods for interactive video. Rutherford and Grana (1995) examined issues related to faculty resistance and made suggestions for how to overcome them. Comeaux (1995) pointed out that a relaxed style, a sense of humor and facilitation of interaction between class locations were important aspects of a successful interactive video course. She also found that students were distracted from instructional content by camera and microphone manipulation and by seeing themselves on monitors.

Subjects and Methodology

The subjects for this study were 29 students and one instructor at a regional state university during Spring Semester, 1996. The students were preservice teachers enrolled in an undergraduate educational psychology course, Learning Theories Applied to the Classroom. They were taking the course on campus (N=8) and at the university's three off-campus centers. One student was at a center approximately 45 minutes from campus, six were approximately one hour and 15 minutes from campus, and 14 were approximately two hours from campus.

Student data included mid-term and final class evaluations (for student reactions), observational handbook grades (for students' ability to recognize the learning theory underlying actual practices in live classrooms), and final grades (for a cumulative assessment of learning in the course. Instructor data included notes (for objective content) and the instructor's observations and cognitive, physical and emotional reactions to the teaching experience. Grades and evaluations from the instructor's recent traditional-classroom learning theory courses were used to make comparisons between the interactive video section and the traditional classroom.

The Course

"Learning Theories Applied to the Classroom" is an upper level course required of all education majors. Several topics in educational psychology are presented and currently an introductory educational psychology text is used. However, the major focus of the course is on behavioral and cognitive learning theories. Students are expected to be able to work with them at all learning levels from knowledge to evaluation. The observational experience which occurs at the end of the course requires students to observe live classrooms,to identify the learning theory underlying selected classroom activities, and to evaluate the use of the theory.

Results

Instructor Reaction

The following is a summary of the instructor's training, preparation and class development process. It also includes discussion of three areas which the instructor found to be of special interest: the needs of younger students, the use of site facilitators, and the importance of flexibility.

Training

The instructor attended a one-day training session to learn how to use the interactive video equipment. She was unable to attend a half-day training program aimed at course and individual class session development, but received the materials from that session for review. However, the instructor found that the most valuable training was the three hours she spent with two successful interactive video instructors on a one-to-basis and the hour of practice time she scheduled in the actual classroom.

Class Preparation

To prepare class for this interactive video course, the instructor, having been told that less material was covered when teaching over interactive video, eliminated 'nice but not necessary' content. Before the beginning of the semester, she structured the general content for each class

session very carefully and developed detailed transparencies, potential activities and lecture outlines for the first three weeks of class. Some sessions covered much more and some much less material than expected and, after the first three weeks, she found it more effective to plan by topic rather than by class period.

Preparation time for each class was enormous - averaging 6 hours. Over half of that time was spent in the development of overheads and activity materials that would be legible for the students at distance sites.

Class Development

Initially, the instructor was bothered by the lack of face-to-face lecture, discussion and conversation. As the semester developed, the professor became more comfortable with the off-campus focus being the overhead outlines and other visuals accompanied by the audio of the lecture. The instructor became more comfortable with the fact that visual lecture and face-to-face discussion and conversation were 'nice but not necessary' components of teaching. The structure the visuals provided seemed to be especially helpful to the students. As the semester progressed, increasing the amount of time spent in the structured presentation of material and activities, replacing the time spent trying to encourage between-site discussion with within-site discussion groups which made reports to all sites, and increasing the amount of time for student questions all proved to be beneficial.

Having only one student in a location presented a difficulty when students were asked to work in pairs. Working with the instructor was difficult because the conversation was distracting for the on-campus students. The site facilitator did not have the knowledge to do some of the exercises. However, the student was bright and could accomplish many of the activities by herself. With many students, however, substitute activities would need to be developed.

Site Facilitators

Each site had a facilitator to handle administrative and technical aspects of the class. The

facilitator was not an educator and was often a student. Of the four facilitators for this class, one was excellent, two were adequate, and one was inadequate. Both too many and too few students seemed to be problematic. With too many students, classroom management is difficult from a distance and an untrained student facilitator could not be expected to know how to help manage a classroom. With only a few students, the personal relationship between the student and the facilitator can lead to problems. For example, because of the expensive equipment, no food was allowed in the interactive video classrooms. In the section of this class with one student, while the camera was transmitting from that site, the facilitator offered the student a plate of cookies. Students at the on-campus site saw this and were upset by 'unequal treatment'. Much out-of-class time was required to resolve the situation with both the on-campus students and the facilitator.

Young Students

Even though this was an upper level course, there were no prerequisites and several traditional age sophomores were in the class. Some of the younger off-campus students needed more academic support than was available at the off-campus centers. One student needed help with writing and two other students felt a need for in-person interaction with the instructor and drove for four hours, round-trip, three times to meet with the instructor. A few of the younger students also enjoyed the attention they received from distracting talk and behaviors during class.

Flexibility

Flexibility in every area of the teaching process was essential. Students needed to learn to be flexible also. At times changing their expectations was more difficult than changing the instructor's habits. Papers got lost being delivered or returned, tests took two weeks to arrive (by daily courier), the interactive video system went down in the middle of a class and was down for all of one class, and playing phone tag with students and center administrators became the

norm. New ways of dealing with distracting students had to be developed. (Silence and a gentle stare do not work at a distance.) After every class the instructor had new ideas, or saw a need to develop new methods, to improve the presentation of the material the next time the course was taught via interactive video.

When students are a one-inch face on a television monitor, it is hard to get to know them as unique individuals. Reading students expressions to see if they understand the material is impossible. Techniques and approaches that have worked for years must be replaced. It is not the major changes that are problematic, it is the small habits, approaches and techniques that professors use without thinking that create difficulties.

At the end of the semester the instructor's major regret was not having more knowledge about the students as individuals. However, she was excited about learning a new approach to teaching. She had learned a tremendous amount about herself as a teacher and as a person. Most important her students had learned a great deal about learning theories.

Student Evaluations

Midterm

Student midterm evaluations indicated that they especially liked the multiple-choice tests, transparencies, examples and explanations, exercises and activities. They also liked the within-site discussions 'even if they are difficult'. In regard to the professor they liked the humor, the friendly, concerned, approachable attitude and the sharing of personal experiences.

At this point the students indicated that they wanted a more structured review for tests, more structure for assignments and more structure for the observation. They also wanted papers returned more quickly. Off-campus students felt the instructor did not focus on them enough and the on-campus students felt that the instructor forgot about them.

Final

Final evaluation comments continued many of the above themes except that the students

seemed to understand that they had to share the professor's attention with three other sites and that no one location could receive the attention they did in a traditional classroom. Students also indicated that they missed having a teacher in the room. However, they felt that not having to drive to campus was a positive balance for the lack of the physical presence of a teacher. Although many had been hesitant about the interactive video course at first, they were satisfied with the class. No student indicated that they would not take another interactive video class or that they were sorry they had taken this one.

Student IDEA Numerical Evaluations

	Interactive Video (N=29)*	Traditional Classroom (N = 50)**
Evaluation Objectives	Mean	Mean
A. Factual Knowledge	4.2*	4.3*
B. Principles and Theories	4.3*	4.4*
C. Professional Skills and Viewpoints	3.9*	4.4*
D. Overall Evaluation (Progress on Objectives)	91**	97**

* Scale = 1-5

** Percentile Rank

Observation Book Grades

	On-Campus KTLN (N=8)		Off-Campus KTLN (N=21)		Total (N=29)*		Traditional Classroom (N = 50)**	
	(N)	%	(N)	%	(N)	%	(N)	%
A	(2)	25	(12)	57	(14)	48	(29)	58
B	(6)	75	(3)	14	(9)	31	(16)	32
C	(0)	0	(4)	19	(4)	14	(3)	6
D	(0)	0	(1)	5	(1)	3	(1)	2
F	(0)	0	(1)	5	(1)	3	(1)	2

* One class, taught Spring, 1996
** Two classes, taught Spring, 1995

Final Grades

	On-Campus KTLN (N=8)		Off-Campus KTLN (N=21)		Total (N=29)*		Traditional Classroom (N = 53)**	
	(N)	%	(N)	%	(N)	%	(N)	%
A	(5)	63	(11)	52	(16)	55	(13)	25
B	(2)	25	(4)	19	(6)	21	(26)	49
C	(1)	13	(3)	14	(4)	14	(9)	17
D	(0)	0	(3)	14	(3)	10	(2)	4
F	(0)	0	(0)	0	(0)	0	(3)	6

* One class, taught Spring, 1996
** Two classes, taught Spring, 1995

Conclusions

General

1. Final grades indicate that students learn as well by interactive video as they do in a traditional classroom

2. Grades on tasks requiring application, analysis, synthesis and evaluation indicate that a larger percentage of off-campus than on-campus students may have difficulty in these areas

3. Combining EMAIL, EMAIL sessions, and some required on-campus sessions with interactive video distance learning could provide the need for face-to-face contact felt by some students

4. An orientation session for students would be helpful

5. Decreasing faculty preparation time is needed

Benefits

Students

1. Access to education

2. Experience with learning through technology

3. Development of responsibility

4. Development of self-directed learning

5. Higher grades

Faculty

1. Experience with teaching with technology

2. An academic and personal challenge

3. Opportunity to combine academic and technology interests

4. Research and curriculum development opportunities

5. Reflection on and improvement of teaching

Problems

Students

1. Some students (especially younger ones) would do better with more academic and personal support from the professor. (Possible solutions: orientation, prerequisites, GPA requirements, use of EMAIL, introductory week of on-campus classes)
2. Expectation of a traditional classroom atmosphere (Possible solutions: orientation, use of EMAIL, EMAIL sessions, introductory week of on-campus classes)
3. Lower Grades (Possible solutions: orientation with focus on importance of self-directed study and responsibility, tutors/study skill help at all centers, formation of small study groups, mentoring at centers)

Faculty

1. Time required for preparation of materials (Possible solutions: have support people available to put faculty member's materials in final form, have portable computers with appropriate software - e.g. Power Point - for each faculty member teaching an interactive video course, allow a faculty member to repeat a course in successive semesters
2. Adjusting to new technology and methodology (Possible solutions: have an interactive video mentor program; have new instructor teach or co-teach a session before beginning a course; have small group discussions, brown bag lunches for instructors while they teach)
3. Working with facilitators and others at off-campus sites (Possible solutions: training, clear roles and job expectations, pre-class session with staff at all sites)
4. Lack of face-to-face contact with students (Possible solutions: have mandatory first or second week on-campus, EMAIL, visit sites, have certain dates when all students

and the instructor meet at different centers, schedule a long Saturday or evening session, schedule private meetings with all students)

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